



# Telehealth contributions to fighting COVID-19

*Contribuição do telessaúde para o enfrentamento da COVID-19*

*Contribuciones de la telesalud para el afrontamiento de la COVID-19*

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## ABSTRACT

**Objective:** To reflect upon how telehealth services can contribute to dealing with the COVID-19. **Method:** This reflective study was based on the literature addressing telehealth as a strategy to deal with the current pandemic due to the coronavirus. **Results:** The COVID-19 has challenged the world's healthcare systems, causing numerous deaths. Social distancing measures stand out among the strategies adopted to prevent the spread of the disease. Although face-to-face consultations play an essential role in the professional health-patient relationship, in-person visits become impracticable during pandemic situations. Hence, the use of technologies, such as telehealth services may prove necessary. This study enables a reflection upon how telehealth contributes to deal with the COVID-19. **Final considerations and implications for practice:** Telehealth services are an important strategy to ensure the population has improved access to health services while improving the screening and monitoring of COVID-19 cases, supporting decreased mobility of people, and preventing the spread of the virus and the overload of healthcare services.

**Keywords:** Telemedicine; Coronavirus; Pandemics; Health Services; Information Technology.

## RESUMO

**Objetivo:** refletir sobre como o telessaúde pode contribuir para o enfrentamento da COVID-19. **Método:** trata-se de estudo reflexivo, realizado com base na literatura acerca do uso do telessaúde como estratégia de enfrentamento da atual pandemia por coronavírus. **Resultados:** a COVID-19 tem-se constituído em um importante desafio global aos sistemas de saúde, sendo responsável por inúmeras mortes. Algumas estratégias de intervenção para evitar a propagação da doença têm sido utilizadas, entre elas destaca-se o distanciamento social. Embora as consultas presenciais desempenhem um importante papel na relação profissional de saúde-paciente, durante situações de pandemias isso pode se tornar inviável. Assim, o uso de tecnologias como os serviços de telessaúde podem se mostrar necessários. O artigo possibilita a reflexão de como o telessaúde pode contribuir como estratégia de enfrentamento da COVID-19. **Considerações finais e implicações para a prática:** os serviços de telessaúde podem se constituir de uma importante estratégia para assegurar a melhoria no acesso aos serviços de saúde para a população e maior efetividade na triagem e monitoramento dos casos da COVID-19, auxiliando na redução da mobilidade dos indivíduos, evitando a propagação do vírus e a sobrecarga dos serviços de saúde.

**Palavras-chave:** Telemedicina; Coronavírus; Pandemias; Serviços de saúde; Tecnologia da Informação.

## RESUMEN

**Objetivo:** Reflexionar sobre cómo la telesalud puede contribuir para el afrontamiento de la COVID-19. **Método:** Este es un estudio reflexivo, basado en la literatura sobre el uso de la telesalud como estrategia para enfrentar la actual pandemia de coronavirus. **Resultados:** La COVID-19 ha sido un importante desafío mundial para los sistemas de salud, siendo responsable por numerosas muertes. Algunas estrategias de intervención para evitar la propagación de la enfermedad han sido utilizadas, entre ellas el distanciamiento social. Aunque las consultas presenciales desempeñan un papel importante en la relación profesional de salud-paciente, durante situaciones de pandemias esto puede volverse inviable. Con esto, el uso de tecnología como los servicios de telesalud puede resultar necesario. El artículo permite la reflexión de cómo la telesalud puede contribuir como una estrategia de afrontamiento de COVID-19. **Consideraciones finales e implicaciones para la práctica:** Los servicios de telesalud pueden ser una importante estrategia para garantizar un mejor acceso a los servicios de salud para la población y una mayor efectividad en el triaje y seguimiento de los casos de COVID-19, ayudando en la reducción de la movilidad de las personas, evitando la propagación del virus y la sobrecarga de los servicios de salud.

**Palabras clave:** Telemedicina; Coronavirus; Pandemias; Servicios de Salud; Tecnología de la Información.

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Submitted on 07/17/2020.  
Accepted on 09/24/2020.

DOI: <https://doi.org/10.1590/2177-9465-EAN-2020-0287>

## INTRODUCTION

Among the global challenges emerging in the context of infectious diseases is the novel Coronavirus 2019, which is highly transmissible and has demanded the attention of health authorities worldwide. The most common symptoms of the Coronavirus Disease 2019 (COVID-19) are fever, fatigue, dry cough, myalgia, and dyspnea. The most severe cases present the acute respiratory syndrome, and individuals 60+ years old or those with associated clinical conditions such as hypertension, diabetes, heart diseases, or respiratory diseases are at a greater risk of complications and death.<sup>1</sup>

The main strategies to combat the COVID-19 pandemic include improved rates of diagnostic tests, clinical management, rapidly isolating suspicious and confirmed cases along with contacts, and significantly restricting mobility using social distancing measures.<sup>2</sup>

Given the context caused by the COVID-19 pandemic in which health care processes undergo significant changes, telehealth becomes an important coping mechanism because it enables patients to be more efficiently tracked at the same time it protects health workers, the community, and the patients themselves from being exposed, avoiding unnecessary commuting, decreasing the time required to provide consultations and diagnosis, supporting social distance and health education practices.<sup>3</sup>

Therefore, it is relevant to consider the impact a telehealth service may have on the organization of the health care network, considering that this technology has the potential to transform care processes and contribute to the fight against the COVID-19, improving the access of the population to health services, and enabling more effective screening and monitoring suspected cases. Considering that telehealth services are still incipient in Brazil within the health care context, we propose a reflection upon the main definitions and evidence involving COVID-19 and telehealth to support the development of strategies to contribute to the consolidation of telehealth services to combat the COVID-19.

Therefore, this paper is intended to reflect upon how telehealth can contribute to fight the COVID-19.

## METHOD

This reflexive study was based on the literature addressing the use of telehealth as a strategy to fight the current coronavirus pandemic. Brazilian and international scientific papers were read with care. Thus, the strategy used was searching for papers addressing the topic in the following electronic databases and libraries: Scientific Electronic Library Online (SCIELO), Medical Literature Analysis and Retrieval System Online (MEDLINE), using the terms "Telemedicine" and "Pandemics" and "Coronavirus" and "Health Services".

Additionally, methodological guidelines and the clarifications provided online by the Ministry of Health, World Health Organization and Pan-American Health Organization regarding the main definitions and evidence concerning the COVID-19 were adopted.

The medicine and nursing federal councils' websites were consulted because part of these resolutions impacts medical and nursing practice.

## RESULTS AND DISCUSSION

### COVID-19: what do we know thus far?

Coronavirus is an RNA virus from the *Coronaviridae* family, responsible for causing respiratory infections. It was isolated for the first time in 1937 and named coronavirus in 1965 due to its crown appearance when seen under microscopy. Thus far, the types of coronavirus described are: alpha coronavirus HCoV-229E and HCoV-NL63; beta-coronavirus HCoV-OC43 and HCoV-HKU1; SARS-CoV, responsible for the Severe Acute Respiratory Syndrome (SARS); MERS-CoV, which causes Middle East Respiratory Syndrome (MERS); and SARS-CoV-2, the novel coronavirus described at the end of 2019.<sup>4</sup>

The first case of COVID-19 was recorded in 2019 by the World Health Organization (WHO), initially considered a mysterious type of pneumonia that originated in Wuhan, China. The disease spread rapidly throughout China, and patients infected by SARS-CoV-2 were then identified in other countries, especially in Europe, the United States, Canada, and Brazil.<sup>5</sup>

On January 30<sup>th</sup>, 2020, the WHO declared that the COVID-19 outbreak was a Public Health Emergency of International Concern, though it was considered a pandemic only on March 11<sup>th</sup>, 2020.<sup>6</sup> Up to August 21<sup>st</sup>, 2020, SARS-CoV-2 had infected 22,536,278 people worldwide and caused 789,197 deaths. In Brazil, 3,582,362 cases and 114,250 deaths were confirmed up to August 22<sup>nd</sup>, 2020. Additionally, the Brazilian Ministry of Health reported community transmission in the entire Brazilian territory and a lethality rate of 3.2%.<sup>7</sup>

COVID-19 can spread from a sick individual to another person through close contact via saliva droplets, sneeze, cough, phlegm, or even contact with contaminated objects or surfaces such as cell phones, remote controls, tables, knobs, among others. Transmission is also possible when in contact with asymptomatic individuals.<sup>5</sup>

The coronavirus 2019 is highly transmissible and presents an overall clinical condition that may range from a simple cold to an acute respiratory syndrome in the most severe cases, and even leading to death. The most common symptoms of COVID-19 are fever, fatigue, dry cough, myalgia, and dyspnea. Some people infected by the SARS-CoV2 may also present pain, congestion, headaches, conjunctivitis, sore throat, diarrhea, anosmia, ageusia, skin rashes, or fingers' or toes' skin discoloration.<sup>1,7</sup> Approximately 80% of the people infected by SARS-CoV2 recover from the disease without the need for hospitalization; however, one in every six people infected with COVID-19 becomes severely sick and has difficulty breathing. Therefore, individuals 60+ years old or those with health conditions, such as hypertension, diabetes, heart or respiratory diseases, or cancer, are more likely to experience complications and become severely ill.<sup>1</sup>

Children are less likely to become sick, and when they do, the disease is mild. Only approximately 2.4% of the cases occur among individuals younger than 19 years old, while 2.5% and 0.2% manifest the disease's severe or critical form, respectively. Though, any individual may become infected with the COVID-19 and manifest the severe form of the disease<sup>4</sup>

The diagnosis of the COVID-19 may be obtained in one of two ways. The first is through a real-time Polymerase Chain Reaction (RT-PCR) test, with total or partial sequencing of the viral genome, in which respiratory material is collected (by aspirating the airway or sputum). The material preferably collected from the lower respiratory tract is recommended (sputum, tracheal lavage fluid, or bronchoalveolar lavage fluid), though upper tract sample is acceptable otherwise.<sup>4,5</sup>

The second way COVID-19 can be diagnosed is through an immunological test, rapid and/or serological test, which is preferably performed between the 7<sup>th</sup> to the 10<sup>th</sup> day after the onset of symptoms. This test can detect the presence of antibodies (IgG and IgM), which are produced by the human body against the SARS-CoV-2.<sup>5</sup>

No vaccine or specific treatment has been devised to prevent or treat the infection caused by the novel coronavirus 2019. Therefore, infected people need to receive care to alleviate the symptoms, while those in a more severe condition should be hospitalized. The WHO is coordinating efforts from all research and health institutions to manufacturing vaccines and drugs to prevent and treat the COVID-19.<sup>7</sup>

There are currently different approaches, including controlling the source of infection; using personal protective equipment to decrease the risk of transmission; and early diagnosis, isolating suspect and confirmed cases, and providing support treatment to infected patients. Consequently, mobility restricted through the imposition of social distancing measures has been considered a key factor to decrease the spread of COVID-19, as it decreases person-to-person contact.<sup>1</sup>

One Chinese study investigating the spatial distribution of COVID-19 cases and the effect of restricted mobility reports that drastic measures substantially decreased the spread of COVID-19, confirming the importance of social distancing measures.<sup>2</sup> Even though the experience of managing the pandemic is quite distinct around the world, the current primary objective is to flatten the epidemiological curve, that is, promote a slower transmission rate of the virus and even interrupt its transmission. This objective is concerned with the potential overload of the health system as a consequence of rapid transmission. Thus, delaying the curve increase enables that individuals infected receive the care required without collapsing the system.<sup>8</sup>

Hence, while the health authorities monitor the progression of the COVID-19 epidemic curve, establishing and investigating preventive measures and healing treatments is imperative for the health systems of different countries establish measures that are appropriate to their contexts, giving priority to social distancing, improving the access of the population to health services, screening, monitoring, and isolating suspected and confirmed

cases, as well as contacts, and mass testing.<sup>9</sup> In this sense, telehealth services are an essential strategy to ensure improved access to health services and achieve greater effectiveness in the screening and monitoring cases.

### **Telehealth and COVID-19: care at a distance**

Even though face-to-face consultations undoubtedly play an important role in the relationship between health workers and patients, in times of pandemic, in-person consultations may be unfeasible. Telehealth represents the use of technology in the health field intended to enable health care is provided at a distance. It can be defined as the remote delivery of health care provided by health workers, using Information and Communication Technologies (ICT) to exchange information that is valid for diagnosing, treating, and preventing diseases or injuries and research, assessments, and education. It is a low-cost service with ample coverage intended to promote the health of all individuals.<sup>10,11</sup>

The telehealth service has several strengths that can contribute to a better response in disasters and pandemics that present environmental or biological risks. During outbreaks of infectious diseases, telehealth can support remote assessments, care delivery, and the delivery of information with easy access through technologies, such as chatbots. Additionally, telehealth consultations contribute to social distancing measures, the primary measure adopted in the outbreak of infectious diseases.<sup>12</sup>

Telehealth has already been used in disasters and previous pandemics at the world level, such as during the Harvey and Irma hurricanes, when private institutions used telehealth services to provide care to victims, locating and relocating them and providing primary health care. Additionally, countries such as Australia have already used it during periods of prolonged and severe droughts. China adopted it shortly after the SARS pandemic that occurred in 2003 when it started investigating the use of telehealth and electronic medical systems for potential use in future situations.<sup>12</sup>

Disasters and pandemics cause turmoil in communities, fear, and panic among people and cause an increase in the search for health services. This increased demand for health services may result in overcrowded emergency rooms, and as a consequence, the presence of many people in emergency services favors increased contamination in the population.<sup>13</sup> Therefore, telehealth services have great potential to support the combat against the COVID-19 pandemic, being an important strategy because it decreases the circulation of individuals in health facilities and the risk of contamination and spread of the disease.

Some countries have adopted this strategy as a way to deal with the COVID-19 pandemic. For instance, Australia has encouraged the population to seek telehealth services, enabling medical teams to contact the community. Similarly, a hospital located in China launched a new telehealth system in January 2020 for the multi-professional team to provide consultations to

risk groups like the elderly, pregnant women, children, and patients with chronic diseases. These examples show how telehealth can promote patients' and workers' safety while it enables efficacious services to all individuals.<sup>9</sup>

In Brazil, telehealth includes the use of ICT for remote health care delivery and is intended to provide safe, effective, efficient, equitable, and patient-centered care. Hence, it works on expanding and improving the health services network, especially Primary Health Care and its interaction with the remaining levels of Health Care Networks that compose the Unified Health System (SUS).<sup>14</sup>

The *Programa Nacional Telessaúde Brasil Redes* [National Telehealth Brasil Networks Program] was established in January 2007 through MS No. 35. It was redefined and expanded through Ordinance No. 2,546, published on October 27<sup>th</sup>, 2011. The services that compose the telehealth program in Brazil are teleconsultations, teliagnosis, telemonitoring, teleregulation, and teleducation. Finally, the second informative response consists of a systematized response based on bibliographic reviews with the best scientific evidence.<sup>11</sup>

Exceptionally and while the COVID-19 pandemic lasts, the different professional councils in the health field have provided resolutions authorizing professionals to work remotely. The resolution from the Federal Council of Nursing (COFEN) No. 634/2020, authorizes and regulates telenursing<sup>15</sup> while the Federal Council of Medicine (CFM) authorizes and regulates telemedicine through CFM No. 1756/2020 and Resolution CFM No. 1,643 from August 26<sup>th</sup> 2002.<sup>16</sup>

The Brazilian government adopted the teleconsultation services within SUS, the teleSUS, to support the combat against the COVID-19. Consultations are provided using the application "Coronavirus SUS" using a chatbot available on the website or through 136 (telephone service) through which patients can contact the system to report signs and symptoms or clarify doubts concerning the COVID-19.<sup>17</sup> Through this app, patients access information concerning the disease and measures that are recommended based on the information patients provide. Additionally, the chatbot informs patients whether they need to stay home or seek a health service.<sup>17,18</sup>

Since April 1<sup>st</sup>, 2020, when the service became available, approximately 27,000 consultations were recorded in these tools until the end of April. Approximately 17,000 calls were recorded to the 136, while 5,500 of these were classified as high risk and referred to teleconsultation with specialized workers. The app and chatbot together recorded 4,000 consultations.<sup>17</sup> Additionally, various states and cities have implemented local telehealth services, supporting the development and structuring of care models and the organization of health networks.

Hence, telehealth enables keeping asymptomatic patients or those with moderate symptoms out of hospitals, at home, and referring more severe cases to in-person consultations. That is, it prevents health services from becoming overloaded and decreasing the time required to receive care. Additionally, via tele-screening, health workers can apply specific protocols

and assess the severity of the symptoms reported by individuals and orient patients to either seek a primary health care unit, an emergency room, hospital, remain at home and monitor symptoms, or provide other guidance appropriate to the situation.<sup>18</sup>

Thus, telehealth also allows that patients with flu-like symptoms or with the potential to be infected with COVID-19 are more efficiently screened and rapidly cared for and isolated, avoiding unnecessary commuting, decreasing the time to achieve a diagnosis.

In some countries, video consultations are part of national health strategies, through which health workers can see and have closer contact with patients; that is, these consultations may be as effective as in-person visits.<sup>18</sup> Therefore, patients receive safe and quality care without leaving their homes, supporting social distancing, and minimizing the virus's spread.

In addition to contributing to social distancing, remote screening within the COVID-19 context protect health workers. With the increase of health workers becoming infected and staying home due to virus exposure, it raised concerns with the workforce's capacity, especially those working in intensive care services.<sup>18</sup>

However, its use is still very limited and has gained notoriety only in cases of disasters or pandemics. The non-acceptance of this service in the daily routine of people is the main barrier to its use. Non-adherence to the service may be associated with limitations imposed on clinical consultation, as it prevents physical assessment of patients, which may be seen as a weakness for properly achieving diagnosis and providing appropriate treatment.

Even though each telehealth service created in the context of the current pandemic seeks to meet local needs based on the health care network structure, most of these services have functioning strategies in common. Hence, among the strategies used is the screening of suspicious cases, based on specific protocols and clinical history collected from patients. Based on the screening process and considering each case's severity, patients can be oriented to seek an in-person health service. In some cases, patients can access tele-orientation services using video systems, enabling in-depth clinical assessments and improved referral potential.

Additionally, telehealth services may include monitoring suspicious cases on the part of epidemiological health surveillance teams, scheduling and referring patients to diagnostic tests, and following up those sheltering in place. Like in-person health services, telehealth services also need to ensure patient information confidentiality and record patient information on an electronic medical file.

Despite the practicality of the telehealth service in the context of the COVID-19 pandemic, it has some limitations, especially to diagnose the disease, considering that no application or virtual consultation can effectively verify whether a patient is infected with coronavirus; thus, face-to-face tests are necessary to identify the virus. Additionally, consultations through tele-screening and teleorientation may not be appropriate for severe patients

(considering there is no physical assessment) and for patients who do not have access to or have difficulties or decreased ability to use technologies.<sup>18</sup>

Hence, despite its potential, telehealth is mainly considered an additional service and is not used to provide care. Therefore, encouraging its use in routine clinical practice<sup>10</sup> and future health workers' training is essential to achieve its adequate use.

For telehealth services to fully achieve its potential usability in pandemic contexts, such as the COVID-19, health workers, patients, and managers of health services, need to make an effort. Therefore, changes are needed for telehealth to be recognized as a central component of the health services, favoring knowledge, and preparation for its use in the future.

## FINAL CONSIDERATIONS AND IMPLICATIONS FOR PRACTICE

The reflections presented in this paper enable concluding that telehealth services can be used to combat the COVID-19 and other situations of public health emergencies. It also favors the organization of health services, implying greater effectiveness in screening and monitoring COVID-19 cases, supporting decreased mobility of individuals, preventing the spread of the virus, and overloading health services.

Few studies address the use of telehealth services, or its use to complement health services, which restrict the reflection presented in this paper. Hence, future studies proposing new reflections regarding telehealth and its impact on the health care system are needed.

The expectation is that after overcoming the challenges imposed by the current pandemic, telehealth services are consolidated in the Brazilian context as a component of health care networks, qualifying health care, making it more effective, efficient, and equitable.

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